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First record of *Batrachoides surinamensis* (Bloch & Schneider, 1801) and *Canthidermis maculata* (Bloch, 1786) (Pisces: Teleostei) from Rio Grande do Norte, northeastern coast of Brazil

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Abstract. A new occurrence each of *Batrachoides surinamensis* and *Canthidermis maculata* is reported in the northeastern coast of Brazil. This report adds to the known records for both species and increases the regional marine fish richness to 461 species. Following these records, 1.6 tons of *C. maculata* were landed from May 2016 to January 2017, representing more than 1,500 individuals caught monthly. While it sheds light on the importance of *C. maculata*, the economic and social role of *B. surinamensis* remains unknown. Likewise, their conservation status is currently uncertain and further investigation is warranted.

Key words. Ichthyofauna; marine biodiversity; new record; Western Atlantic Ocean; Pacuma Toadfish; Rough Triggerfish

The fish family Batrachoididae is represented in Brazil by 6 genera and 13 species (Menezes et al. 2003), including Pacuma Toadfish, *Batrachoides surinamensis* (Bloch & Schneider, 1801). *Batrachoides surinamensis* is typically found in shallow brackish waters of estuarine environments (Léopold 2004). It has been recorded from Central America (Honduras) to Brazil (Bahia state) (Collette & Russo 1981; Carvalho-Filho 1999). The Rough Triggerfish, *Canthidermis maculata* (Bloch, 1786), is a member of the family Balistidae, which is represented in Brazil by 4 genera and 6 species (Menezes et al. 2003). *Canthidermis maculata* is an oceanic pelagic fish that has a circumglobal distribution in tropical and temperate seas. In the Western Atlantic, it occurs from New Jersey (USA) to Argentina (McEachran & Fechhelm 2005). Here, is reported the first record of both species on the coast of Rio Grande do Norte state (RN), northeastern Brazil (Fig. 1).

On 10 October 2015, 1 specimen of *B. surinamensis* (Fig. 2) was collected by researchers with trawl net at about 2 m deep in Rio das Conchas (05°03′35″ S, 036°46′10″ W), a river located in the city of Porto do Mangue, northern coast of RN. The individual was identified as *B. surinamensis* based on diagnos-

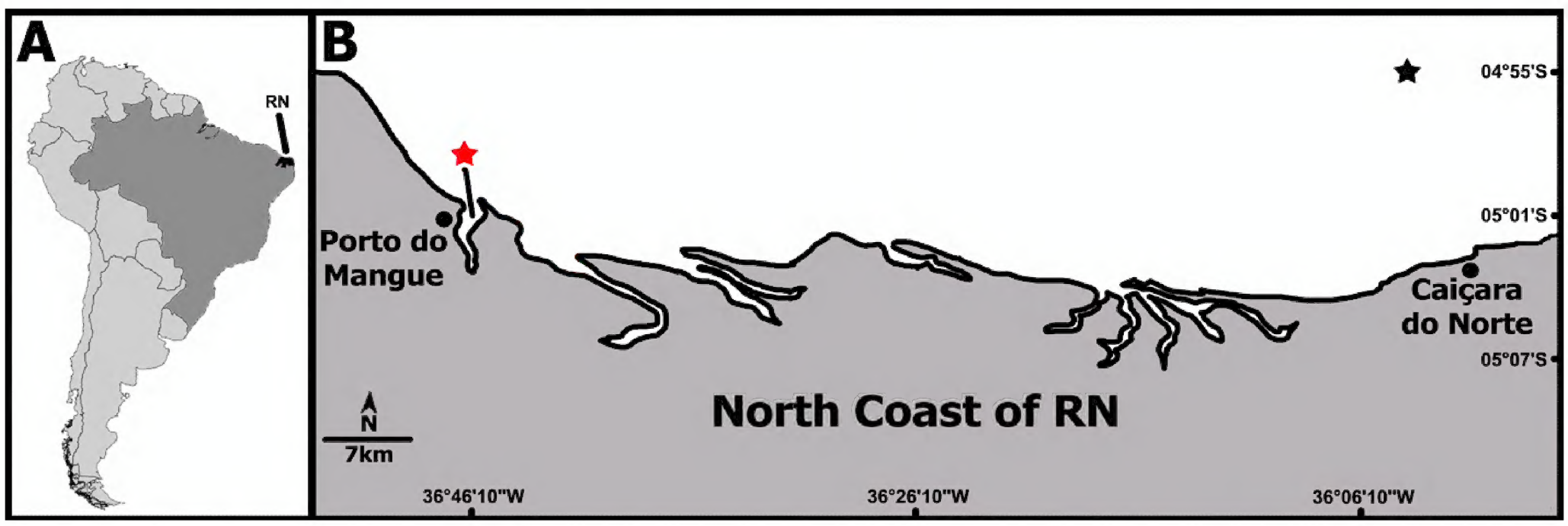

Figure 1. A. Geographical localization of the Rio Grande do Norte state (RN) in the South America. **B.** North coast of RN. Red star indicates the site where *Batrachoides surinamensis* was caught. Black star indicates the site where *Canthidermis maculata* was caught.

Figure 2. *Batrachoides surinamensis*, 488 mm, LABIPE 1051.

Figure 3. *Canthidermis maculata*, 400 mm, LABIPE 1101.

tic scheme proposed by Collette & Russo (1981). The main morphometric and meristic data (Table 1) observed agree with the description reported by these authors. On 19 May 2016, 2 specimens of *C. maculata* (Fig. 3) were caught on the surface by an artisanal fishing boat with dip nets, at Urca da Conceição (04°55′ S, 036°05′ W), a 20 m deep reef located at 9 nautical miles northwest of the city of Caiçara do Norte, northern coast of RN. The individuals were identified as *C. maculata* based on characters reported by Moore (1967) and McEachran & Fechhelm (2005), with main morphometric and meristic data (Table 2) in agreement with the criteria given by these authors. All specimens were fixed in 10% formalin, transferred to 70% ethanol and deposited in the Fish Collection of Laboratory of Fisheries Biology at Federal University of Rio Grande do Norte (*B. surinamensis*, LABIPE 1051, and *C. maculata,* LABIPE 1101 and 1102). All morphometric data were taken using digital calipers with 1 mm precision and total weight was measured to the nearest 1 g using an electronic weighing balance.

Table 1. Morphometric and meristic characters of *Batrachoides surinamensis* (LABIPE 1051).

Morphometric	Size (mm)	Meristic	
Total length	488	Dorsal rays	29
Standard length (SL)	422	Anal rays	26
Head length	187	Pectoral rays	22
Head width	110	Upper lateral line pores	55
Orbit diameter	9.5	Lower lateral line pores	53
Interorbital distance (ID)	60	Pectoral fin glands	10
Snout–2D	235	Subopercular spines	2
Snout–A	280.5	Weight (g)	1975
Pectoral length	92		
Pelvic length	75		
Eye size (% SL)	2.25		
Eye in ID	6.35		

The specimen of *B. surinamensis* was identified based on following distinctive characteristics: body with embedded small scales with a scaled area on head extending to middle of orbit and opercular spine, opercular and subopercular bones with 2 spines, 3 dorsal fin spines, and supraorbital and interorbital region smooth, without any filament.

The specimens of *C. maculata* were identified based on following main characteristics: absence of flexible tympanum, mouth terminal, 23 or 24 dorsal fin rays, 20 or 21 anal fin rays, gray-to-brown body, lighter ventrally and with some light spots on the sides and ventral surface of the body.

Batrachoides surinamensis is reported in literature as ranging in Brazil from Amapá to Bahia states and it was recently recorded in Amapá (Maia et al. 2016), Pará (Ferreira et al. 2011), Maranhão (Piorski & Nunes 2010), Piauí (Mai et al. 2012), Ceará (Osório et al. 2011), Paraíba (Oliveira 2011), Pernambuco (Pinto et al. 2015), and Alagoas (Paiva et al. 2013). In

Table 2. Morphometric and meristic characters of *Canthidermis maculata*.

Morphometric (mm)	LABIPE 1101	LABIPE 1102
Total length	400	437
Standard length	335	368
Head length	108	120
Snout length	71	76.5
Body height	127	136
Body width	56	59
Predorsal distance to first dorsal	110	121
Predorsal distance to second dorsal	190	218
Anteanal distance	216	243
Base length second dorsal	96	99
Base length anal	80	89
Eye diameter	21	27
Interorbital width	39	54
Branchial aperture length	23	26
Length of the first spinous ray first dorsal	37	45
Length of the longest ray second dorsal	66	85
Length of the longest ray anal	64	70
Distance between first and second dorsal	59	66
Length of the longest ray pectoral	33	38
Length of caudal	56	63
Caudal peduncle height	37	41
Caudal peduncle length	47	52
Meristic		
First dorsal spines	3	3
Second dorsal rays	24	23
Anal rays	21	20
Pectoral rays	14	14
Caudal rays	5+5	5+5
Lateral line scales	46	49
Weight (g)	970	1345

Bahia, the recognized southern limit of the range for this species, the only record found was the MCZ Thayer Expedition specimen from Salvador city (Collette & Russo 1981). Following the new record described here, Sergipe state currently figures as the only gap in this species' distribution along its expected range. Most likely this gap is a consequence of poor sampling, mainly in estuarine areas. An increased sampling effort in brackish waters of estuarine environments, where the species is typically found, would probably fill this gap.

Although the distribution of *Canthidermis maculata* is expected to extend along the entire Brazilian coast, this species was only recorded in Bahia (Moraes et al. 2008) and Santa Catarina states (Hostim-Silva et al. 2002). In addition, Murray (1902) reported the occurrence of this species (as *Balistes maculatus*) around Trindade Island, located 1160 km off the central coast of Brazil. Herein is reported the third confirmed record of *C. maculata* for the Brazilian coast.

Recently, the coastal fish species of Rio Grande do Norte was revised totaling 459 species, including 4 species of batrachoidids and 5 balistids (Garcia Jr. et al. 2015). Therefore, the new occurrences reported here enlarge the distributions for both *B. surinamensis* and *C. maculata* and increase the number of species in this state to 461 species.

Even though both species are now listed as Least Concern by the International Union for Conservation of Nature (Collette 2010; Leis 2015) and by the Brazilian Red List of Endangered Species/BRL-EndS (Decree no. 445; MMA 2014), the conservation status may not represent historical declines. In Rio Grande do Norte, fishing activities are considerably unregulated, unreported, and to some extent also illegal (Ross et al. 2015; Damasio et al. 2015; Bevilacqua et al. 2016). Some fisheries and target species are poorly assessed or not assessed at all, and the presence, abundance, and availability for fisheries of some species might be misreported. Therefore, their actual conservation status might have been unknown to researchers, fisheries managers, and younger fishers before such species were first assessed. This seems to be the case, for example, for *C. maculata*; in data collected from fishers (see Damasio et al. 2015), elderly fishers reported high catches of triggerfishes prior to 2003 and the complete disappearance of current landings. However, fishers used just common names (cangulo) and grouped together several species such as *Balistes vetula*, *B. capriscus*, and *Cantherhines macrocerus*. Thus, poor historical data on species' occurrence do not allow for the precise identification of species. The implication of this lack of historical information is the assumption that *C. maculata* is under Least Concern for the fishery, economy, and conservation. In general, the major interest in research has been on the commercially important fishes, resulting in less research effort on non-commercially important species such as *C. maculata* (Abdussamad et al. 2009).

Nonetheless, there is increasing demand and global exploitation of Rough Triggerfish for human consumption, export, and for aquarium purposes (Sahayaki et al. 2014). Consequently, this species has economic and social importance for communities around the Indian, Atlantic, and Pacific oceans, enhancing

Figure 4. *Canthidermis maculata* landed on 2 March 2017 in the main port of Rio Grande do Norte state. The photo shows roughly 100 individuals. Total landings recorded in this date reached 600 kg of the species.

the accumulation of biological and ecological information (Sahayaki et al. 2014; Lezama-Ochoa et al. 2016). Following this trend, after this first record of *C. maculata*, during 5 months of ongoing landing records, we recorded the landing of 1.6 tons of this species at the main port of RN state (230 km from the record reported herein) (Fig. 4). On average, this represents 230 kg of *C. maculata* landed monthly and roughly more than 1500 individuals caught per month in the northeastern coast of Brazil. Therefore, we are optimistic that the new record reported here and the record of these landings will boost interest in better understanding the importance of *C. maculata* in the Western Atlantic. However, while the records presented here sheds light on the importance of *C. maculata*, the economic and social role of *B. surinamensis* remains unknown. Likewise, their conservation status is currently unsure and warrants further investigation.

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